

Providing Safe Drinking Water to the Public

What are my responsibilities to ensure safe drinking water under the Safe Drinking Water Act, 2002 and Ontario Regulation 170/03?



A guide for owners and operators of non-residential and seasonal residential
DRINKING WATER SYSTEMS THAT SERVE DESIGNATED FACILITIES

Designated facilities are buildings and places for people who may be more susceptible to illness from drinking water of poor quality. Designated facilities include:

- children's camps
- child and youth care facilities, including day nurseries
- health care facilities including hospitals, nursing homes and seniors' residences
- social care facilities receiving funding from the Ontario government
- hostels and other delivery agent care facilities
- schools and private schools
- universities, colleges of applied arts and technology, or institutions with the authority to grant degrees.

Important: Even if your drinking water system only supplies water to a designated facility for a limited time during the year, your system is subject to O. Reg 170/03 requirements year-round.

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An on-line version of this guide can be found at www.ontario.ca/drinkingwater.

A: Introduction

Under the Safe Drinking Water Act, 2002 and the Drinking-Water Systems Regulation (O. Reg. 170/03), owners and operators of drinking water systems that supply water to the public have responsibilities to ensure the water is safe to drink. This guide outlines the responsibilities of owners and operators of non-residential and seasonal residential drinking water systems that serve designated facilities.

Designated facilities provide water to people who may be more susceptible to adverse effects from consuming poor quality drinking water, especially children, the elderly, and patients with certain medical conditions.

Following this guide and complying with the regulation will help to ensure that the health of these Ontarians is protected and that drinking water standards are maintained.

Remember, this guide is only a summary.

To be clear about your specific requirements, you must refer to the text of the Drinking Water Systems Regulation (O. Reg. 170/03) and the Safe Drinking Water Act, 2002. You can access these at www.e-laws.gov.on.ca or by calling our Public Information Centre at 1-800-565-4923. If you have any legal questions about the application or interpretation of the regulation or legislation, you should consult a lawyer.

Summary of requirements

This chart summarizes your drinking water system's requirements. The guide gives further details.

Registration	All drinking water systems serving designated facilities must register with the Ministry of the Environment (ministry). This information is stored in the ministry's Drinking Water Information System (DWIS).
Microbiological sampling/testing of the raw water	Only for systems with a source that is ground water or ground water under the direct influence of surface water (known as a GUDI source). Collect samples every month from each well in the system prior to any form of treatment, and submit to a licensed laboratory for testing (<i>E. coli</i> and total coliforms only).
Microbiological sampling/testing of the drinking water in the distribution system or plumbing	Collect and submit samples once a month to a licensed laboratory for testing if the system is providing treatment according to the regulation (note: additional samples may be required for the non-municipal seasonal residential category). Testing for <i>E. coli</i> and total coliforms is required for all systems. Heterotrophic plate count (HPC) must also be tested if the distribution system is required to have secondary disinfection (chlorine residual).
Chemical sampling/testing	Collect samples from the point where water enters the distribution system or plumbing (unless otherwise specified) and submit to a licensed laboratory. Samples must be tested for nitrate and nitrite once every three months; lead every 12 months; however, the frequency for lead sampling is reduced to once every 36 months if in the most recent 24-month period there have been no lead test results that exceed the standard. (Note: these provisions are not applicable to systems serving only a school, private school or day nursery - see page 14 for more information.) All other chemical tests are performed once every 60 months.
Systems receiving transported water	The storage container that receives the water, e.g., a cistern, must be constructed and maintained to prevent contamination.
Water treatment	Ensure treatment equipment is installed and operated in accordance with the regulation.
Operational checks	Routine maintenance and operational checks are required to be carried out, and monitoring for chlorine residual and turbidity may be required, depending on your system. A "trained person" (someone who has taken an approved course in the last three years) is required for these activities under most circumstances.
Engineering evaluation reports	A licensed engineering practitioner must prepare a report on treatment equipment that includes a maintenance schedule and a statement confirming that all equipment is being installed in accordance with the regulation. Subsequent reports are only required if alterations are carried out to the system. Systems receiving transported water are not required to have an Engineering Evaluation Report.
Annual reports	These must be prepared every year and a copy kept on-site to be made available to the public and the Ministry of the Environment upon request. A copy must also be sent to each designated facility served by the system and the interested authority for each such designated facility.
Adverse test results and other problems	Report adverse test results and other problems related to improper disinfection to authorities and take corrective action.

B: Does this guide apply to my drinking water system?

Answer these two questions to determine whether this guide applies to your system:

1. Does your drinking water system serve a designated facility?

These facilities include children's camps; day nurseries as defined in the Day Nurseries Act (i.e., receive more than five children who are not of common parentage); other children and youth care facilities that provide services or are licensed under the Child and Family Services Act or Ministry of Community and Social Services Act (e.g., child development, treatment or welfare services, young offender services, Ontario Early Years Centres, licensed children's residences, etc.); nursing homes, homes for special care under the Homes For Special Care Act, and other health care facilities; schools, private schools and university/college facilities; social care facilities receiving funding from the Ontario government (e.g., sheltered workshops, employment programs, violence against women programs and places funded under the Aboriginal Healing & Wellness Strategy). **Please see the definitions of “designated facility,” “children and youth care facility,” “delivery agent care facility,” “health care facility” and “social care facility” in section 1 of O.Reg 170/03 for more details on what these terms mean.**

If the answer is YES, then go to question 2 below. If the answer is NO, this guide does not apply to you.

Note: Some drinking water systems serve both designated and public facilities. A public facility is any place, other than a private residence, where the general public has access to a washroom, drinking water fountain or shower. For example, a system may serve a day nursery as well as a recreational facility or a restaurant. Pages 8, 9, 10 and 13 in the guide discuss details about situations where drinking water systems serve both designated and public facilities.

2. Is your category of drinking water system covered by this guide?

O. Reg. 170/03 divides drinking water systems into various categories of systems. Any category of drinking water system can serve a designated facility, and different categories may have different regulatory requirements. This guide **does not** apply to your drinking water system that serves a designated facility if your system is a:

- municipal residential system (i.e., a municipal drinking water system that supplies water to six or more private residences) where all the piping of the designated facility is plumbing under the Building Code or
- non-municipal year-round residential system (i.e., a privately owned system that supplies water year-round to six or more private residences or six or more service connections in a trailer park or campground).

If your system serves a designated facility and falls into any other category, then this guide applies to your system.

This is a basic explanation for determining whether or not this guide applies to your system. If you are still unsure, or need more information, consult O. Reg 170/03 at www.e-laws.gov.on.ca or call the ministry’s Public Information Centre at 1-800-565-4923.

C: Determining your drinking water source

All drinking water systems draw from raw water supplies, such as ground water or surface water, unless they are receiving treated water from another regulated system. This guide describes

GUDI (Ground Water Under the Direct Influence of surface water) refers to a well which may be subject to surface water contamination.

the specific requirements that apply to the various drinking water sources:

- Ground water (secure wells)
- Ground water under direct influence of surface water (GUDI – wells which may be subject to surface water contamination)
- Surface water (lakes, rivers and streams)
- Transported water (treated water brought in from other regulated systems and stored on site, e.g., cisterns).

D: Nine steps to providing safe drinking water

Step 1: Register your drinking water system

- All drinking water systems serving designated facilities must be registered with the Ministry of the Environment (ministry). Registration information helps meet our shared commitment to safe clean water for the people of Ontario.
- To register, complete the *Drinking Water System Profile Information* form on the ministry's Drinking Water Ontario website at www.ontario.ca/drinkingwater under Forms. Once complete, email it to: Reg170_formsubmission.moe@ontario.ca.
- Once you have registered, you will be sent a letter with your drinking water system number (DWS#) and category. Use this DWS# for reference purposes when contacting the registration team and when using ministry and laboratory forms.
- You must register within 30 days of beginning operations.
- Any changes to your drinking water system (e.g., contact information or changes in water treatment equipment) must be submitted via email to Reg170_formsubmission.moe@ontario.ca within 10 days of the change.
- If you have any questions about registration, call the Registration Help Desk at 1-866-793-2588.

Step 2: Select a licensed laboratory

- Regulated drinking water systems must have their water tested on a routine basis. Drinking water samples must be sent to a laboratory licensed by the ministry for specific testing of microbiological and/or chemical parameters. (See box on next page for information about finding a licensed laboratory.)
- It is important that you contact the licensed laboratory directly to arrange for testing PRIOR to submitting samples to them.
- Before sending your samples to a licensed laboratory for the first time, you must submit the *Laboratory Services Notification* form to the ministry (available on Drinking Water Ontario at www.ontario.ca/drinkingwater under Forms) which identifies the licensed laboratory(ies) that you have hired and the specific testing they will be performing.
- It is extremely important that your registration information is fully completed and up-to-date at all times. Test results will not be considered by the ministry unless all of this information is included in laboratory submissions.
- It is strongly recommended that you provide the name of a back-up licensed microbiological laboratory on your *Laboratory Services Notification* form in case the primary laboratory encounters equipment or testing problems. As an owner you are required to submit a *Laboratory Services Notification* form to the ministry each time you change or hire new laboratories for testing.
- Your licensed laboratory must send a written report of all results to you within 28 days of approving the results. Your results are also submitted electronically to the ministry.
- If the licensed laboratory finds an adverse test result, they must notify you, the ministry, and the local medical officer of health immediately by telephone. The laboratory must then fax the adverse test results to the ministry and the local medical officer of health within 24 hours. Pages 15-19 of this guide explain the procedures you must follow if this happens.

Finding a licensed laboratory

- To hire a licensed laboratory for testing, view the list of licensed laboratories on the ministry's website at www.ontario.ca/drinkingwater under Testing and Labs; or contact the Public Information Centre at 1-800-565-4923, or contact a laboratory directly. You must use a laboratory licensed by the Ministry of the Environment for specific testing of your drinking water.
- While some of the larger laboratories may be licensed for all of the required tests under the regulation, some licensed laboratories only test microbiological parameters (*E. coli*, total coliforms and HPC) while others test only chemical parameters (e.g., arsenic or benzene, etc.).

Step 3: Take drinking water samples for testing

- Licensed laboratories must provide you with sample containers and instructions on how to collect, transport and store the samples taken from your drinking water system. Common instructions include: removing screens/filters at any taps; allowing the water to run for at least two minutes; not touching or otherwise contaminating sample bottles; capping bottles immediately; leaving airspace so that the bottle does not overflow; and preventing splashing.
- Pay particular attention to the instructions for sample temperature. Do not freeze samples. Make sure that if samples are being transported in a vehicle, they are kept in a cooler with ice packs or other means to keep them cool.
- Whenever a sample is collected, the person taking the sample must record the date, time and location where it was taken, and the sampler's name on the *Chain of Custody* form. This form can be obtained from your laboratory. The laboratory's *Chain of Custody* form will be customized for your drinking water system and sent to the sampler with the sampling containers.

- Once the samples are submitted to the licensed laboratory, staff will record details of the samples (i.e., date/time the samples were received, analyst and testing details, final test results, etc.).

What are my MICROBIOLOGICAL sampling and testing requirements?

How often samples need to be taken and submitted for testing

Raw water sampling:

- Ground water and GUDI – once a month from each well.
- Surface water – none required.
- Transported water – none required, but the storage container that receives the water (e.g., a cistern) must be constructed and maintained in a manner that prevents surface water and other foreign materials from coming into contact with the treated drinking water.

Distribution sampling

 (drinking water taken from distribution or plumbing fixtures such as taps):

- Once every month if treatment is provided in accordance with the regulation.
- Once every two weeks if treatment is not provided in accordance with the regulation.

Note: If your system is using **point of entry (POE) treatment** (see page 10), these distribution samples must be taken on a rotating basis so that a sample is taken from a location downstream of the POE treatment unit in each home and facility supplied by the system, at least once every 24 months. This ensures that a sample is taken from a location downstream of all the other POE treatment units before returning to a location that has already been sampled.

What do licensed laboratories test for?

They test for the following bacteria:

- *E. coli*
- Total coliforms
- Heterotrophic plate count or “HPC” (only for distribution samples and only if the distribution system is required to have secondary disinfection, i.e., chlorine residual – see page 10).

HPC is a microbiological laboratory test that gives a measurement of the general bacterial population present within your distribution system or plumbing. HPC results are a good indicator of overall water quality but not water safety. Drinking water distribution lines are not sterile, and some microorganisms can attach to the inner lining of the pipes and grow. There are no reporting or corrective action requirements specified in O. Reg. 170/03 following HPC test results. It is suggested, however, that you monitor your HPC results in order to develop a good sense of what the normal or “baseline” levels of HPC measurements are in water from your system.

If you see an abrupt spike in HPC counts, it may indicate a problem with your water treatment processes, or perhaps the sloughing-off (detachment) of the organisms that may have attached and grown on the inner lining of the distribution pipes. You should double-check all your treatment and monitoring equipment, and make sure that all of your system’s maintenance programs have been rigorously followed. A gradual and steady increase in HPC counts can indicate regrowth of organisms in the system and an overall decline in the water quality.

To solve the problem, you may want to raise the frequency with which you flush the distribution lines and increase the overall chlorine residual levels throughout your system. By following these simple steps, the HPC results can be used towards maintaining and improving the overall water quality and management of your system and may help to prevent other problems from occurring.

Note: If your drinking water system is using chlorine, then **you must also sample and test for chlorine residual (the chlorine that stays in the lines to prevent microbiological regrowth) using the appropriate analyzer (see page 13) at the same time and location your microbiological distribution samples are taken.** You must record the chlorine residual value clearly on the Chain of Custody form provided by your licensed laboratory. In the event there is a microbiological adverse test result, the laboratory is required to tell the ministry and the local medical officer of health what chlorine level was recorded on the form.

How soon must samples be taken?

- Existing systems should already be sampling their water.
- New systems must begin sampling as soon as they commence operation and as soon as the Laboratory Services Notification form is submitted.

Note: If you have a **non-residential** drinking water system and your system is not operating for seven consecutive days or more to supply water to any open designated or public facility, then you do not have to take microbiological samples for that period of time.

If you have a **seasonal** residential system and your system is not operating for seven consecutive days or more to supply water to any of the users listed below, then you do not have to take microbiological samples for that period of time:

- any open designated or public facility
- six or more private residences
- any trailer park or campground with six or more service connections.

However, upon restarting your system, you must sample, submit samples to your licensed laboratory and receive the results prior to supplying drinking water to users of the system.

What are my CHEMICAL sampling and testing requirements?

Where to sample:

- A point where water enters the distribution system, or plumbing that is connected to the drinking water system.
- Lead must be sampled from a location that is most likely to have higher lead levels (e.g., the oldest pipes).
- If your drinking water system supplies only to a school, private school, or day nursery, Schedule 15.2 of O. Reg. 170/03, which is related to lead testing, does not apply to you. With respect to lead testing, you are only subject to requirements under O. Reg. 243/07 made under the Safe Drinking Water Act, 2002. See page 14 for more information.

How often samples need to be taken and submitted for testing

- All organic and inorganic parameters listed in Schedules 23 and 24 of O. Reg. 170/03, sodium and fluoride – at least once every 60 months.
- Nitrate and nitrite – at least once every three months.
- Lead – at least once every 12 months. The frequency is reduced to once every 36 months if the most recent 24-month period no lead test results have exceeded the standard for lead, which is 10 micrograms per litre. This reduction includes systems receiving transported water but does not apply to schools, private schools or day nurseries, as they are subject to O. Reg. 243/07 – see page 14. If there is an adverse result, the sampling frequency returns to once every 12 months.

How soon must samples be taken?

New systems must start sampling within 12 months after commencing operation, although nitrate and nitrite need to be done by the third month of operations.

Note: You are not required to perform any sampling or testing for nitrate and nitrite during a period of 60 or more consecutive days when the system is not in operation or the system is not supplying water to any open designated or public facility.

Step 4: Determine the minimum treatment requirements for your drinking water system

All systems serving designated facilities were required to install treatment equipment in accordance with O. Reg 170/03 on or before July 1, 2004. If your system is new, treatment equipment must be installed in accordance with O. Reg. 170/03 prior to commencing operation. Treatment processes **must** also be in accordance with the ministry's *Procedure for Disinfection of Drinking Water in Ontario*. The procedure is available at www.ontario.ca/drinkingwater under Guidance.

Treatment basics

Below is a basic summary of treatment processes that will reduce or eliminate the potential for the presence of pathogens (organisms that can cause illness) in your drinking water. Different water sources necessitate different levels of treatment.

You may wish to consult with a licensed engineering practitioner about the different types of treatment technologies that are available to meet your specific requirements (see Engineering Evaluation Report, page 11).

Different treatment methods

Filtration of raw water removes particles that may hide or protect pathogens such as viruses, bacteria and protozoa, and helps to ensure that effective primary disinfection can be carried out.

- Where filtration is required, the filtration process must occur before the primary disinfection process.
- Filtration technologies include conventional chemically assisted rapid sand filtration, direct chemically assisted rapid sand filtration, slow sand filtration, diatomaceous earth filtration, cartridge/bag filters and membrane filters. Your licensed engineering practitioner will advise you on the most appropriate technology for your system.

Primary disinfection inactivates/removes pathogens before the water is delivered to the first consumer. This usually is accomplished by filtration and chlorine or by filtration and ultraviolet (UV) light or by chlorine only, depending on the quality of the raw water source.

- Where chlorine is used for primary disinfection, the process must involve a contact time (e.g., in a holding tank) during which the water is exposed to a specified chlorine dose that must be monitored.
- Where UV or other non-chlorine-based primary disinfection equipment is used, the equipment must have either an automatic shut-off feature or an alarm that notifies the operator if the equipment malfunctions, loses power or is not providing appropriate levels of disinfection. The alarm must sound where the testing equipment is located. If a person is not always present where the equipment is located, then the alarm must sound in a place where someone is present. If an alarm sounds, a trained person (or certified operator for large systems – see page 12) must be dispatched to take appropriate action as soon as possible.

Secondary disinfection introduces and maintains a chlorine residual in your lines to protect the drinking water from microbiological recontamination or bacterial regrowth.

- Secondary disinfection is required if all parts of the drinking water system and plumbing downstream of the primary disinfection equipment are not enclosed in a building or other protective structure.
- For the purpose of secondary disinfection, chlorination equipment must be operated so that, at all times and at all locations within the distribution system, the free chlorine residual is never less than 0.05 mg/L.
- Often, secondary disinfection is provided by the treatment equipment which supplies primary disinfection. If chlorine-based equipment is used to provide primary disinfection, that equipment may be used to provide secondary disinfection. However, where UV light or other non-chlorine-based equipment is used to provide primary disinfection, that equipment is unable to provide secondary disinfection. Therefore, additional chlorine-based equipment would be needed to meet any secondary disinfection requirements.

Point of entry (POE) treatment units

Point of entry treatment units are primary disinfection units that are installed on the plumbing at or near where water from the system enters a building or other structure. Schedule 3 of O. Reg. 170/03 provides a detailed explanation of POE system requirements and obligations that may allow you to be exempt from secondary disinfection (chlorine residual in the distribution system) requirements.

Some things to consider if you plan to use a point of entry approach towards treatment:

- POE units must be installed on the plumbing of **every** building or other structure that is part of a designated facility or public facility served by the system.
- Notice must be given to occupants of a property where POE units are located whenever permission to enter a property is required.
- Accessible or automatic shut-offs may be required depending on the drinking water system.
- Additional requirements may apply. See Schedule 3 in O.Reg 170/03 for more details.

Treatment requirements depending on the source of your water

Ground water source

Unless you obtain exemptions from treatment requirements, your ground water system must have water treatment equipment that is capable of achieving, at all times, **primary disinfection**. This includes removing or inactivating at least 99 per cent of viruses in accordance with the *Procedure for Disinfection of Drinking Water in Ontario*, available at www.ontario.ca/drinkingwater under Guidance.

Surface water or GUDI source

Unless you obtain exemptions from treatment requirements, you must use **filtration** and **primary disinfection** such that the total process is capable at all times of removing or inactivating 99 percent of Cryptosporidium oocysts, 99.9 per cent of Giardia cysts, and 99.99 per cent of viruses in accordance with the *Procedure for Disinfection of Drinking Water in Ontario*, available at www.ontario.ca/drinkingwater under Guidance.

Distribution Systems

Where the treated water is distributed to users through a system of buried pipes, primary disinfection must be followed by **secondary disinfection** which introduces and maintains a chlorine residual level in the distribution system.

Storage of Transported Water

All systems that receive transported water must ensure that the storage container, e.g., a cistern, is constructed and maintained in a manner that prevents surface water and other foreign materials from coming into contact with the treated water.

Engineering Evaluation Report

When installing treatment equipment under this regulation, a licensed engineering practitioner with experience in sanitary engineering or a person under his or her supervision must be retained.

A licensed engineering practitioner is a person who holds a license, limited license or temporary license under the Professional Engineers Act. This includes:

- people who are fully licensed to practice engineering in Ontario or
- those who are allowed to practice engineering within a limited scope, including writing *Engineering Evaluation Reports* (EER) or
- temporary license holders who have been licensed from another jurisdiction and are here to practice engineering for a specific period of time.

Practitioners can tell you which type of license they hold.

They assess your system in order to determine the proper treatment solution that is needed for compliance with the regulation. The licensed engineering practitioner must then prepare an EER. The report must state:

- that they, or a person under their supervision, has visited your drinking water system and
- that in the licensed engineering practitioner's opinion, all equipment needed to comply with the treatment requirements and with the operational checks is being provided.

The report must also set out the reasons for the licensed engineering practitioner's opinion; specify the category of the drinking water system; and

include a maintenance schedule for equipment to be inspected, tested and replaced.

Names of some resources that may assist you finding a licensed engineering practitioner are available at www.ene.gov.on.ca/publications/5677e.php or contact Consulting Engineers of Ontario at 416-620-1400 or Professional Engineers Ontario at 1-800-339-3716.

Systems receiving transported water are not required to have an EER since the water has already been treated.

Existing systems

The EER must have already been submitted to you within 30 days of the deadline for installation of treatment equipment.

For new systems and altered systems

An EER must be completed and submitted to you within 30 days after a new system begins operation or an alteration is completed on an existing system.

You must submit written notice to the ministry within seven days of the day that the EER is required using an *Engineering Evaluation Report Notice* available on the ministry's Drinking Water Ontario website at www.ontario.ca/drinkingwater under Forms. Do not submit the actual EER to the ministry, just the notice. The notice can be submitted via email to reg170_formsubmission.moe@ontario.ca, by fax, or by mail. Keep the report on file and make sure it is available upon request. If you require assistance, please call 1-866-793-2588 during normal business hours.

You must also submit the written notice to the interested authority for the designated facility, if applicable. The **interested authority** is usually the Ontario government ministry to which the designated facility is responsible, e.g., the Ministry of Health and Long-Term Care if it is a hospital.

Step 5: Ensure maintenance and operational checks are carried out

Proper day-to-day operation of your drinking water system is the responsibility of the system owner. The following operational tasks must be performed by a certified operator or a trained person, depending on the size of the system and in accordance with the regulation:

- conducts tests on-site such as chlorine residual and filter effluent turbidity
- makes all adjustments to the water treatment equipment
- examines the results of continuous monitoring equipment within 72 hours of the water samples being taken
- takes appropriate action at the location where the equipment is installed if disinfection equipment malfunctions, loses power or ceases to provide the appropriate level of disinfection
- is promptly dispatched if alarms sound due to an equipment malfunction, loss of power or a test result that does not meet the standards established by O. Reg. 170/03
- performs regular maintenance checks on the water treatment equipment to ensure proper functioning.

For large non-residential systems, a certified operator is a person who holds a Class 1-4 Water Treatment, Water Distribution or Water Distribution and Supply certificate or who holds the applicable Limited Subsystem certificate issued under O. Reg. 128/04 (Certification of Drinking-Water System Operators and Water Quality Analysts).

For more information on becoming certified, contact the Ontario Water Wastewater Certification Office at www.owwco.ca or by calling 416-231-2100 or 1-877-231-2122.

For small non-residential systems, a trained person is a person who is a certified operator or who in the preceding 36 months has successfully completed a course approved by the ministry that relates to the operation and routine maintenance of drinking water systems. A correspondence course entitled Operation of Small Drinking Water Systems has been approved for this purpose. For more information on the correspondence course and other training opportunities, please contact the Walkerton Clean Water Centre at www.wcwc.ca or by calling 1-866-515-0550. Other approved courses are listed at www.owwco.ca.

Despite these requirements, a person working under the supervision of a certified operator is also allowed to perform on-site chlorine residual and turbidity testing, as long as that person has been trained by the certified operator to conduct the test, and the person immediately advises the certified operator of all test results. A person holding a Water Quality Analyst certificate may also perform these tests. Materials for training the supervised person may be downloaded from www.ontario.ca/drinkingwater under Guidance.

Type of System	Requires
Large municipal non-residential	Certified Operator
Large non-municipal non-residential	
Small municipal non-residential	
Small non-municipal non-residential	Trained Person
Non-municipal seasonal residential	

Operational test basics

Below is a summary of the regulatory requirements related to operational tests to be carried out on the system.

See the ministry fact sheet, *Tips for Maintenance of Small Drinking Water Systems*, for more detailed information at www.ontario.ca/drinkingwater under Guidance.

Test turbidity

- Use a turbidity meter that measures in Nephelometric Turbidity Units (NTUs).

Monitor raw water turbidity (only required for large non-residential systems that have a ground water supply)

- A turbidity sample must be taken and tested **every month** from each well from a location before the raw water enters the treatment system.

Monitor filter effluent turbidity (only required for systems that require filtration)

- If continuous monitoring equipment is used, ensure that sampling and testing for turbidity is conducted by continuous monitoring equipment on **each** filter effluent line, and that requirements of section 6-5 of O. Reg. 170/03 have been met.
- If continuous monitoring equipment is not required and not used, ensure that a daily water sample is taken on **each** filter effluent line and tested for turbidity.
- Exemptions may be available if you have installed UV disinfection equipment with automatic shut-offs. Consult section 8-4 of Schedule 8 or 9 of O. Reg 170/03 for more information.
- The *Procedure for Disinfection of Drinking Water in Ontario*, found at www.ontario.ca/drinkingwater under Guidance, lists the required frequency of turbidity testing depending on the filtration method used. Cartridge/bag filters and slow sand filtration methods allow the operator the option of monitoring turbidity on a daily basis, whereas

other filtration methods are required to have continuous monitoring.

Test chlorine

- Use an electronic direct readout colourimetric or amperometric chlorine analyzer, or another device that a licensed engineering practitioner considers equivalent.
- If continuous monitoring equipment is used, ensure that requirements of section 6-5 of O. Reg. 170/03 have been met.

Monitor primary disinfection

- If chlorination is used for primary disinfection and continuous monitoring is not used, **daily** chlorine residual tests are required at a minimum. Samples must be taken from a location where the intended contact time has just been completed.

Monitor secondary disinfection

- If you are required to provide secondary disinfection, you must conduct **at least two samples per week** for chlorine residual in the distribution system at least 48 hours apart. Samples must be taken from a location significantly beyond the point at which water enters the distribution system or plumbing, and randomly throughout the distribution system.

Note: If you have a **non-residential** system and all designated and public facilities served by the system are not open, then you do not have to perform equipment maintenance checks or test for chlorine residual or turbidity during that time.

If you have a **seasonal** residential system and if your system is not supplying water to any of the following users for a period of 60 or more consecutive days, then you do not have to perform equipment maintenance checks or test for chlorine residual or turbidity for that period of time:

- open designated or public facilities
- six or more private residences
- any trailer park or campground with six or more service connections.

Flushing and Sampling for Lead (Schools, Private Schools and Day Nurseries only)

Ontario has introduced new requirements for flushing and testing of drinking water taps in schools, private schools and day nurseries under Ontario Regulation 243/07 (Schools, Private Schools and Day Nurseries) made under the Safe Drinking Water Act, 2002. According to Health Canada, research shows that exposure to even small amounts of lead can be harmful to human health, especially for young children, infants and pregnant women. Long-term chronic exposure to lead may increase the risk of subtle impairments to intellectual development. The flushing of plumbing has been shown to reduce lead levels in water at the tap.

O. Reg. 243/07 is intended to reduce children's exposure to lead in drinking water. The regulation requires flushing of plumbing potentially containing lead in schools, private schools and day nurseries and lead-related testing to measure the potential presence of lead in water against the provincial drinking water standard of 10 micrograms per litre. The regulation focuses on lead-related requirements to better align flushing and sampling

with test results history that will continue to help safeguard the drinking water in schools, private schools and day nurseries without compromising health protection.

Each facility's lead testing results and the age of its plumbing will determine the frequency of flushing and the requirements for taking lead samples and submitting them for testing at a licensed laboratory. The table below outlines these flushing and sampling requirements.

To be clear about your specific legal requirements, you must refer to the text of O. Reg. 243/07 (Schools, Private Schools and Day Nurseries). You can access this regulation at www.e-laws.gov.on.ca or by calling the Ministry of the Environment's Public Information Centre at 1-800-565-4923.

You may also want to refer to *Flushing and Testing for Lead in Drinking Water: A guide for schools, private schools and day nurseries on flushing, sampling and testing for lead in drinking water*, an online copy of which can be accessed at www.ontario.ca/drinkingwater under Lead and Drinking Water.

FLUSHING AND TESTING FOR LEAD IN DRINKING WATER Schools, Private Schools and Day Nurseries	
DAILY FLUSHING	WEEKLY FLUSHING
Flush daily if:	Flush weekly if:
Lead test results in past 24 months were above the standard OR	Samples from at least a full 24-month period were below the standard OR
Any part of the plumbing was installed before January 1, 1990 and there was no sampling and testing for a full 24-month period OR	All plumbing was installed after 1990.
Required by the ministry.	
ANNUAL SAMPLING AND TESTING	SAMPLING AND TESTING EVERY 3 YEARS
Sample and test annually if:	Sample and test once every 3 years if:
Lead test results in last 24 months were above the standard OR	Samples from at least a 24-month period are below standard and water from taps used by children throughout the facility are tested AND
Required by the ministry.	Ministry receives a completed Notice of Reduced Lead Sampling form.

Step 6: Notify authorities of adverse test results and other problems

An adverse test result is one that is prescribed under section 16-3 of Schedule 16 of O. Reg. 170/03. This includes a result that exceeds any of the standards prescribed by Schedule 1, 2 or 3 to the Ontario Drinking Water Quality Standards if the result is from a sample of drinking water. O. Reg. 169/03 (the Ontario Drinking Water Quality Standards) can be found at www.e-laws.gov.on.ca. Adverse test results and other problems related to improper disinfection are required to be reported to the authorities.

When a water sample is submitted to a licensed laboratory for testing, your laboratory will notify you if you have an adverse test result.

What to do if you have an adverse test result

You should ensure ahead of time that contact information for the ministry's Spills Action Centre and your local medical officer of health is easily accessible to anyone who may need it.

As soon as you become aware of an adverse test result, you are required to immediately contact your local medical officer of health AND the ministry's Spills Action Centre (SAC) at **1-800-268-6060**.

You may be informed about an adverse test result from:

- your licensed laboratory or
- a test result of a sample taken on-site or
- if you observe that your drinking water system is directing water to users that has not been disinfected according to the ministry's *Procedure for Disinfection of Drinking Water in Ontario*.

This document can be found at www.ontario.ca/drinkingwater.

Note: As of December 14, 2009, systems receiving transported water that are required to take chlorine residual tests must report low test results to the local medical officer of health, the Spills Action Centre and the operator of the designated facility.

See next page and Schedule 16, section 16-3 of O. Reg. 170/03 for more details.

First: Make an immediate report

Immediately report the adverse test result or other problem to all of the following:

- your local medical officer of health at the local public health unit, by speaking with someone in person or on the telephone. Contact information for your local public health unit can be found in your blue pages or at www.health.gov.on.ca/english/public/contact/phu/phu_mn.html
- the ministry's Spills Action Centre (telephone 1-800-268-6060); the Spills Action Centre is open 24 hours/day and 365 days/year
- the operator of each designated facility served by your system, by speaking with someone in person or on the telephone if that operator is someone other than yourself.

Second: Deliver written notice

Within 24 hours of giving the verbal notice, you must deliver written notice to all of the following:

- the local medical officer of health by fax or in person
- the ministry's Spills Action Centre by fax at 1-800-268-6061
- the operator of a designated facility by fax or in person if that operator is someone other than yourself
- the interested authority for the designated facility by fax.

Use the Notice of Adverse Test Results and Other Problems available at www.ontario.ca/drinkingwater under Forms.

Third: Deliver follow-up notice of corrective action taken

Once you have resolved the issue that gave rise to the adverse test result or other problem, within seven days of resolution you must complete and submit Section 2(B) Notice of Issue Resolution, on the same *Adverse Test Results and Other Problems* notice form, available at www.ontario.ca/drinkingwater under Forms.

The follow-up written notice must summarize the corrective action taken and the results achieved.

- Send the notice to the local medical officer of health and the ministry's Spills Action Centre within seven days of resolving the issue.
- Send the notice to the interested authority for the designated facility within 30 days.

Step 7: Take corrective action if required

If you are required to report an adverse test result or other problem, not only must you notify the appropriate authorities as stated above, you must also follow corrective actions to resolve the problem and protect the people who are using your water.

You must follow the proper set of corrective actions for the specified adverse result or problem (refer to the chart beginning on the next page). There is also a ministry fact sheet, *Corrective Actions to Take if Your Drinking Water Becomes Contaminated* at www.ontario.ca/drinkingwater under Guidance.

You can also contact your local Ministry of the Environment office for further advice on any adverse test results. Visit www.ontario.ca/drinkingwater under Contact Us for contact information.

**What corrective actions must you take following adverse test results or other problems?
(See schedule 18 of O. Reg. 170/03 for more information).**

For systems not currently using chlorine:

following any adverse microbiological test results, take the corrective action as outlined in the ministry's Procedure for Corrective Action for Systems Not Currently Using Chlorine (available on the ministry's Drinking Water Ontario website at www.ontario.ca/drinkingwater under Guidance).

For systems providing chloramination: please refer to O. Reg. 170/03, sections 18-4 to 18-9 for further details on specific corrective actions to be taken.

IN ALL CASES, YOU MUST CONSULT WITH THE LOCAL MEDICAL OFFICER OF HEALTH AND TAKE ANY ADDITIONAL STEPS THAT ARE DIRECTED

Adverse test result or other problem	First step	Second step	Third step
<i>E. coli</i> are detected in a test result from a drinking water sample.	Immediately take all reasonable steps to notify users to use an alternate source of drinking water or, if no alternate source is available, bring water to a rapid boil for at least one minute before use.	Immediately resample and test (see Note on page 19). Immediately increase the chlorine dose and flush the distribution system and plumbing to ensure that a free chlorine residual of at least 0.2 mg/L is achieved at all points in the affected parts of the distribution system and plumbing.	Maintain the free chlorine residual or combined chlorine concentration in the affected parts of the system and continue to resample and test until <i>E. coli</i> is no longer detected in two consecutive sets of samples taken 24 to 48 hours apart, or as otherwise directed by the local medical officer of health.
Total coliforms are detected in a test result from a drinking water sample.	Resample and test as soon as reasonably possible (see Note on page 19).	If resample confirms total coliforms, immediately increase the chlorine dose and flush the distribution system and plumbing to ensure that a free chlorine residual of at least 0.2 mg/L is achieved at all points in the affected parts of the distribution system and plumbing.	Maintain the free chlorine residual concentration in the affected parts of the system and continue to resample and test until total coliforms are no longer detected in two consecutive sets of samples taken 24 to 48 hours apart.
Sodium concentration that exceeds 20 mg/L and a report of an adverse test result has not been made in the previous 57 months.	Resample and test as soon as reasonably possible (see Note on page 19).	If resample confirms exceedance, consult with the local medical officer of health on further actions.	
Water not disinfected properly is directed to users.	Immediately restore the disinfection, if possible, before notifying users.	Immediately take all reasonable steps to notify all users to use an alternate source of drinking water or, if no alternate source is available, bring water to a rapid boil for at least one minute before use.	Take any other steps directed by the local medical officer of health.

Continued on next page

Adverse test result or other problem	First step	Second step	Third step
If filtration is required, the turbidity in filter effluent is more than 1.0 NTU.	<p>Immediately check the turbidity monitoring equipment and correct any problems identified. If no problems are identified:</p> <ul style="list-style-type: none"> • immediately backwash the nearest filter upstream of the sample location, or • immediately replace the filter cartridges or filter elements of the nearest filtration equipment upstream of that location, and • immediately review other upstream operational processes and correct any faulty processes identified. 	Immediately after the first step, resample and test. If resample confirms exceedance, immediately take all reasonable steps to notify users to use an alternate source of drinking water or, if no alternate source is available, bring water to a rapid boil for at least one minute before use.	<p>Follow the manufacturer's recommendations for servicing the filtration equipment upstream of the location, and flush the distribution system and plumbing.</p> <p>Take any other steps directed by the local medical officer of health.</p>
If secondary disinfection is required, free chlorine residual is less than 0.05 mg/L.	Immediately flush the distribution system and any plumbing, and restore secondary disinfection to ensure free chlorine residual level of at least 0.05 mg/L is quickly achieved at all points in the affected parts of the distribution system and plumbing.	If 0.05 mg/L of free chlorine residual cannot be quickly achieved at all points in the affected parts, immediately take all reasonable steps to notify users to use an alternate source of drinking water or, if no alternate source is available, to bring water to a rapid boil for at least one minute before use.	Take any other steps directed by the local medical officer of health.
<p>Exceedance of a chemical or radiological parameter listed in Schedule 2 or 3 of the Ontario Drinking Water Quality Standards Regulation (O. Reg. 169/03).</p> <p>Presence of a pesticide as reported by the licensed laboratory.</p>	Resample and test as soon as reasonably possible (see Note page 19).	<p>Consult with the local medical officer of health and take any steps directed by them, if the resample confirms:</p> <ul style="list-style-type: none"> • an exceedance of a chemical or radiological parameter based on the standard in Schedule 2 or 3 of the Ontario Drinking Water Quality Standards, or • that a pesticide has been detected. 	

Note: To “resample and test” for a **microbiological parameter**, you must immediately collect and transport a set of at least three drinking water samples for the parameter which caused the adverse test result to your licensed laboratory for analysis. The first sample must be from the same location as the sample that gave rise to the corrective action. The second sample must be from a location that is a significant distance upstream from the location of the adverse result, where reasonably possible. The third sample must be from a location that is a significant distance downstream from the adverse result, where reasonably possible.

Unless it is a test conducted on-site, to “resample and test” for a **non-microbiological parameter**, you must collect and transport a water sample for the parameter which caused the adverse water quality from the same location as the sample that gave rise to the corrective action to your licensed laboratory for analysis.

8: Post warning notices of potential problems whenever required

You must post approved Ministry of the Environment-issued warning notices if:

- following adverse test results or other problems, you are required to notify users to use an alternate source of drinking water or, if no alternate source is available, to bring water to a rapid boil for at least one minute before use or
- you are not currently meeting your sampling requirements or
- you have not yet carried out required corrective actions.

Where to obtain official warning notices

Warning notices must be in a form provided by or approved by the ministry. There are two types of warning notices available from the Ministry of the Environment. Ensure with ministry staff that the proper notice is used.

You can obtain Ministry of the Environment-approved warning notices by calling the Public Information Centre at 1-800-565-4923 or from your local ministry district office.

If you have not yet obtained warning notices, you can (as an interim measure) post any sign that states: “Public Notice: Do not drink this water” until you have received the ministry-approved warning notices.

Where to post warning notices

- Warning notices must be posted in prominent locations where they are likely to be seen by those using water from the system.
- Warning notices must also be posted at every entrance to every building or structure that is part of a designated facility.
- If you do not own or operate the designated facility, you do not have to post notices in the designated facility as above, but you must ensure that the operator of the facility is provided with:
 - sufficient copies of the warning notices and
 - instructions to post the warning notices as above.
- If you fail to post a warning notice at your drinking water system, a provincial officer, public health inspector or agent of the interested authority may do so instead.

Warning Notices DO NOT provide an exemption from testing or corrective action! The warning notices required to be posted are a temporary requirement meant to protect users of the system in the short term. The owner must still comply with testing and corrective action requirements as soon as possible, despite posting the warning notices.

Step 9: Prepare an annual report and retain records

All drinking water systems subject to the Drinking Water Systems Regulation must prepare an annual report each year, a copy of which must be kept on-site. A copy must also be given to each designated facility served by the system, and if applicable, to each interested authority.

For most systems to which this guide applies, the annual report must cover the period from April 1 of the previous year to March 31 of the current year and must be prepared by May 31 of every year.

Different deadlines may apply to some systems – consult section 11 of O.Reg 170/03 for more information. You can either use the Annual Report template available on the ministry's Drinking Water Ontario website at www.ontario.ca/drinkingwater under Forms or create your own template. The annual report must include:

- a description of the drinking water system
- a summary of any adverse test notices
- a summary of all tests and their results
- a summary of any corrective actions undertaken
- a description of any major expenses for the system.

Keep copies of all the test results from your required samples, every order that applies to the system, and your Engineering Evaluation Report (in addition to your annual report) on-site. Where continuous monitoring equipment is used, only the daily minimum, maximum and mean results need to be available. You must make them available free of charge to the public, upon request, at the facility between 9:00 a.m. and 5:00 p.m. or during normal business hours. You must also have a copy of O. Reg. 170/03 available to the public.

Records and reports must be kept for certain time periods for review by ministry inspectors and any licensed engineering practitioner/hydrogeologists preparing an opinion, report or assessment regarding your system for the purposes identified in O. Reg. 170/03.

Keep the following for at least **two years**:

- operational test results
- microbiological test results
- records of maintenance checks and activities.

Keep the following for at least **six years**:

- lead, nitrate and nitrite test results
- annual reports.

Keep the following for at least **15 years**:

- inorganic, organic, sodium and fluoride test results
- any other chemical or radiological, pesticide, and health-related parameter test results
- engineering evaluation reports.

E: Who can I contact for more information?

If you would like other guides and fact sheets related to drinking water, please visit the ministry's Drinking Water Ontario website at www.ontario.ca/drinkingwater or contact the Public Information Centre at picemail.moe@ontario.ca or 1-800-565-4923/416-325-4000.

You can also sign up for drinking water updates by sending an email to: drinking.water@ontario.ca and requesting that you be added to the mailing list.

